REMARKS

Request for Reconsideration, Informal Matters, Claims Pending

The non-final Office Action mailed on 10 June 2005 has been considered carefully. Reconsideration of the claimed invention in view of the amendments above and the discussion below is respectfully requested.

The Applicants respectfully decline to include a summary in the specification.

Claims 1-37 are pending.

Allowability of Claims Over Rigopulos & Hruska

Rejection Summary

Claims 1-29 and 34-36 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 5,763,804 (Rigopulos) in view of U.S. Publication No. 2001/017415 (Hruska). Office Action, 10 June 2005, para. 3.

Allowability of Claim 1

Regarding Claim 1, contrary to the Examiner's assertion, Rigopulos and Hruska fail to disclose or suggest an

> ... method for creating a polyphonic audio mix on a handheld mobile wireless communication device having a soundtrack data set file stored thereon, comprising:

> entering first reference data for a first soundtrack of the soundtrack data set file into an audio mix data reference file by selecting the first soundtrack,
>
> entering second reference data for a second soundtrack of the soundtrack data set file into the audio mix data reference file by selecting the second soundtrack,
>
> the audio mix data reference file having the first and second reference data representative of a user defined polyphonic audio mix;
>
> storing the audio mix data reference file having the first and second reference data on the handheld mobile wireless communication device separately from the soundtrack data set file.

The Examiner's references to various passages of Rigopulos do not support the assertion that Rigopulos discloses the limitations of Claim 1. Particularly, Rigopulos does not enter first and second reference data for first and second soundtracks into an audio mix data reference. Rigopulos discloses a music synthesizer on a personal computer wherein a user creates music by operating a joystick or other input device. At col. 8, lines 35-58, Rigopulos discloses selecting a background track that is played while operating the input device. After selecting the background track, the user in Rigopulos is allowed to select a musical instrument. Rigopulos, col. 8, line 65 – col. 9, line 12. In Rigopulos, there is no discussion of entering reference data from the selected background track into a reference file. Rigopulos also fails to disclose storing a reference file having the first and second reference data separately from a soundtrack data set file from which the first and second soundtrack were selected. In Rigopulos, the background track is either loaded into memory for play or streamed from a hard drive. The Examiner relies on Hruska for teaching a handheld mobile device having an audio mixer, but Hruska also fails to disclose or suggest the limitations discussed above. Claim 1 is thus patentably distinguished over Rigopulos and Hruska.

Allowability of Claim 2

Regarding Claim 2, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... entering first time data associated with the first reference data into the audio mix data reference file, entering second time data associated with the second reference data into the audio mix data reference file.

At col. 3, lines 5-11 (referenced by the Examiner), Rigopulos discusses the storage of background tracks and rhythm blocks containing note duration notes on a media storage device. As noted, Rigopulos does not create an "audio mix data reference file" into which time data is entered. Claim 2 is thus further patentably distinguished over the art.

Allowability of Claim 3

Regarding Claim 3, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... entering tempo data associated with the user defined polyphonic audio mix into the audio mix data reference file.

While the background tracks of Rigopolus contain a tempo track, there is no disclosure in Rigopolus of entering tempo data in an audio mix data reference file. Claim 3 is thus further patentably distinguished over the art.

Allowability of Claim 4

Regarding Claim 4, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... entering reference soundtrack data into the audio mix data reference file.

Rigopulos does not enter soundtrack data into a reference file. Claim 4 is thus further patentably distinguished over the art.

Allowability of Claim 5

Regarding Claim 5, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... entering the first reference data by selecting the first soundtrack,
> entering second reference data by selecting the second soundtrack while the first soundtrack is playing,
> playing the second soundtrack with the first soundtrack after selecting the second soundtrack.

At col. 8, lines 40-50, Rigopolus merely discusses a setup stage during which a user selects a background track, which is played while creating music with the joystick. Rigopolus does not disclose playing first and second soundtracks upon selecting a second soundtrack while playing a first soundtrack. Claim 5 is thus further patentably distinguished over the art.

Allowability of Claim 6

Regarding Claim 6, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... entering the first reference data by selecting the first soundtrack,
> entering first effect reference data for a first soundtrack effect of the soundtrack data set file by selecting the first soundtrack effect while the first soundtrack is playing,
> playing the first soundtrack effect with the first soundtrack upon selecting the first soundtrack effect.

Rigopolus does not disclose playing first and second soundtracks upon selecting a second soundtrack while playing a first soundtrack. Claim 5 is thus further patentably distinguished over the art.

Allowability of Claim 7

Regarding Claim 7, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... integrating the audio mix data reference file and the soundtrack data set file into a common audio format file.

Rigopolus does not disclose generating an "audio mix data reference file" and thus there is no reason for Rigopolus to integrate a reference file and a data set file into a common format. None of the passages of Rigopolus referenced by the Examiner disclose or suggest generating an audio mix data reference file. Claim 7 is thus further patentably distinguished over the art.

Allowability of Claim 8

Regarding Claim 8, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... irreversibly integrating the audio mix data reference file and the soundtrack data set file into a common audio format file.

Rigopolus does not disclose an "audio mix data reference file" and thus there is no reason for Rigopolus to irreversibly integrate a reference file and a data set file into a common format. None of the passages of Rigopolus referenced by the Examiner disclose or suggest generating an audio mix data reference file. Claim 8 is thus further patentably distinguished over the art.

Allowability of Claim 9

Regarding Claim 9, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 1

> ... playing the user defined polyphonic audio mix on the handheld mobile wireless communication device by playing the first and second soundtracks of the soundtrack data set file referenced by the first and second reference data in the audio mix data reference file.

Rigopolus does not disclose an "audio mix data reference file" and thus Rigopolus cannot play an audio mix using an audio mix reference file. None of the passages of Rigopolus referenced by the Examiner disclose or suggest generating an audio mix data reference file. Claim 9 is thus further patentably distinguished over the art.

Allowability of Claim 10

Regarding Claim 10, contrary to the Examiner's assertion, Rigopulos and Hruska fail to disclose or suggest an

> ... method for playing a polyphonic audio mix on a handheld mobile wireless communication device having a soundtrack data set file stored thereon, comprising:
> playing a first soundtrack of the soundtrack data set file referenced in an audio mix data reference file,
> playing a second soundtrack of the soundtrack data set file referenced in the audio mix data reference file,
> the audio mix audio file devoid of soundtrack data of the soundtrack data set file,
> the audio mix audio file stored separately from the soundtrack data set file on the handheld mobile wireless communication device.

Rigopolus does not disclose playing soundtracks referenced in a reference file. Rigoplous discloses generating music using a joystick or other input device in which the user can control the notes played and pitch of a selected instrument with an accompaniment (background track). Rigoplous does not disclose an audio mix audio file devoid of soundtrack data. The Examiner relies on Hruska for teaching a handheld mobile device having an audio mixer, but Hruska also fails to disclose or suggest the limitations discussed above. Claim 10 is thus patentably distinguished over the art.

Allowability of Claim 11

Regarding Claim 11, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 10

> ... playing the first and second soundtracks at times specified by the audio mix data reference file.

At col. 7, lines 50-51 (referenced by the Examiner), Rigoplous discloses playing the melody upon depressing a button on the joystick, not based on times specified by a reference file. Claim 11 is thus further patentably distinguished over the art.

Allowability of Claim 12

Regarding Claim 12, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 10

> ... playing the user defined polyphonic audio mix on the handheld mobile wireless communication device at a tempo specified by the audio mix data reference file.

At col. 9, lines 29-33, Rigoplous discloses modifying a default playing style of the selected background track. The background track of Rigopolus is not a polyphonic audio mix since it contains only a single track. Claim 12 is thus further patentably distinguished over the art.

Allowability of Claim 13

Regarding Claim 13, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 10

> ... irreversibly integrating the audio mix data reference file and the soundtrack data set file into a common audio format file.

Rigopolus does not disclose an "audio mix data reference file" and thus there is no reason for Rigopolus to irreversibly integrate such a reference file and a data set file into a common format. None of the passages of Rigopolus referenced by the Examiner disclose or suggest generating an audio mix data reference file. Claim 13 is thus further patentably distinguished over the art.

Allowability of Claim 14

Regarding Claim 14 contrary to the Examiner's assertion, Rigopulos and Hruska fail to disclose or suggest an

> ... method for a polyphonic audio mix on a handheld mobile wireless communication device having a soundtrack data set file and an audio mix data reference file stored separately thereon, comprising:
> integrating the audio mix data reference file and the soundtrack data set file into a common audio format file,
> the audio mix data reference file having first and second soundtrack reference data referencing first and second soundtracks of the soundtrack data set file,
> the audio mix data reference file devoid of soundtrack data from the soundtrack data set file;
> uploading the common audio format file from the handheld mobile wireless communication device.

Rigopolus does not disclose an "audio mix data reference file" and thus there is no reason for Rigopolus to integrate such a reference file and a soundtrack data set file into a common audio file format and uploading the common audio format file. None of the passages of Rigopolus referenced by the Examiner disclose or suggest generating an audio mix data reference file. The Examiner relies on Hruska for teaching a handheld mobile device having an audio mixer, but Hruska also fails to disclose or suggest the limitations

discussed above. Claim 14 is thus further patentably distinguished over the art.

Allowability of Claim 15

Regarding Claim 15, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 14

> ... irreversibly integrating the audio mix data reference file and the soundtrack data set file into the common audio format file.

At col. 19, lines 15-21 (referenced by the Examiner), Rigoplous discusses saving the users performance on a hard drive. However, Rigopolus does not disclose an "audio mix data reference file" and thus there is no reason for Rigopolus to irreversibly integrate a reference file and a data set file into a common format. None of the passages of Rigopolus referenced by the Examiner disclose or suggest generating an audio mix data reference file. Claim 15 is thus further patentably distinguished over the art.

Allowability of Claim 16

Regarding Claim 16, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 14

> ... before integrating, creating the audio mix data by entering first reference data for the first soundtrack into the audio mix data reference file and by entering second reference data for the second soundtrack into the audio mix data reference file.

Since Rigopolus does not disclose a reference file or integrating the reference file with a soundtrack data set file, there is no reason for Rigopolus to create audio mix data by entering reference data into a reference file. Claim 16 is thus further patentably distinguished over the art.

Allowability of Claim 17

Regarding Claim 17, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 16

> ... entering corresponding time data associated with the first and second reference data into the audio mix data reference file.

At col. 3, lines 5-11 (referenced by the Examiner), Rigopulos discusses the storage of background tracks and rhythm blocks containing note duration notes on a media storage device. As noted, Rigopulos does not create an "audio mix data reference file" into which time data is entered. Claim 17 is thus further patentably distinguished over the art.

Allowability of Claim 18

Regarding Claim 18, contrary to the Examiner's assertion, Rigopulos and Hruska fail to disclose or suggest an

> ... method for a polyphonic audio mix on a handheld mobile wireless communication device, comprising:
> selecting a first soundtrack;
> playing the first soundtrack upon selecting the first soundtrack;
> selecting a second soundtrack while playing the first soundtrack;

playing the second soundtrack upon selecting the second soundtrack while playing the first soundtrack.

Rigolopus does not play the first soundtrack (background track) upon selecting it. In Rigolopus, the background track is selected in the setup stage (col. 8, lines 43-59) but not played until the joystick START button is depressed (col. 9, lines 33-39). After the setup is complete, the user selects an instrument. Col. 8, lines 66-67. In Rigopolus, however, music is not created using the instrument until the user depresses the PLAY button on the joystick. Thus Rigopolus does not play the second soundtrack upon selecting the second soundtrack. The Examiner relies on Hruska for teaching a handheld mobile device having an audio mixer, but Hruska also fails to disclose or suggest the limitations discussed above. Claim 18 is thus patentably distinguished over the art.

Allowability of Claim 19

Regarding Claim 19, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 18

... a soundtrack data set file including the first and second soundtracks stored on the handheld mobile wireless communication device,

entering first reference data for the first soundtrack of the soundtrack data set file into an audio mix data reference file upon selecting the first soundtrack,

entering second reference data for the second soundtrack of the soundtrack data set file into the audio mix data reference file upon selecting the second soundtrack,

the audio mix data reference file representative of a user defined polyphonic audio mix;

storing the audio mix data reference file on the handheld mobile wireless communication device.

Rigopolus does not disclose or suggest generating or storing "audio mix reference file." Claim 19 is thus further patentably distinguished over the art.

Allowability of Claim 20

Regarding Claim 20, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 19

> ... playing the user defined polyphonic audio mix on the handheld mobile wireless communication device by playing the first and second soundtracks of the soundtrack data set file referenced in the audio mix data reference file.

Rigopolus does not disclose or suggest an "audio mix reference file" and thus Rigopolus does not suggest playing a polyphonic audio mix by playing soundtracks referenced on an audio mix data reference file. Claim 20 is thus further patentably distinguished over the art.

Allowability of Claim 23

Regarding Claim 23, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 22

> ... selecting at least one subsequent soundtrack after selecting the reference soundtrack while the reference soundtrack is playing, mixing the at least one subsequent soundtrack selected with the reference soundtrack upon selecting the subsequent soundtrack.

Rigoplous does not mix upon selecting. As noted, Rigopolus mixes upon pressing the START and PLAY buttons on the joystick after selecting. Claim 23 is thus further patentably distinguished over the art.

Allowability of Claim 28

Regarding Claim 28, Rigopulos and Hruska fail to disclose or suggest in combination with Claim 18

> ... selecting a global audio characteristic common to all selected soundtracks while playing the selected soundtracks for which the global audio characteristic is selected, changing the audio characteristic of all selected soundtracks while the soundtracks are playing upon selecting the global audio characteristic.

Rigopolus only controls characteristics of the instrument using the joystick. The characteristic of the background soundtrack can only be changed pressing the START button. Claim 28 is thus further patentably distinguished over the art.

Allowability of Claim 34

Regarding Claim 34, contrary to the Examiner's assertion, Rigopulos and Hruska fail to disclose or suggest a

> ... method for creating a polyphonic audio mix on a handheld mobile wireless communication device, comprising:
> selecting a first soundtrack having a first time interval;

> selecting a second soundtrack having a second time interval, the second time interval different than the first time interval;
> mixing the first and second soundtracks.

Rigopolus controls the time interval when mixing, i.e., by depressing the PLAY button while the accompaniment (background track) is playing. The background track in Rigopolus has no time interval associated therewith. The user controls the playing of the background track by depressing the START button. The time interval of the instrument depends on how long the user depresses the PLAY button. Thus the first and second soundtracks of Rigopolus do not have associated different time intervals. The Examiner relies on Hruska for teaching a handheld mobile device having an audio mixer, but Hruska also fails to disclose or suggest the limitations discussed above. Claim 34 is thus patentably distinguished over the art.

Allowability of Claim 35

Regarding Claim 36 Rigopulos and Hruska fail to disclose or suggest in combination with Claim 34

> ... saving an audio mix reference file corresponding to a polyphonic audio mix, the audio mix reference file referencing the first and second soundtracks stored in a separate file, playing the polyphonic audio mix by referencing the first and second soundtracks with the audio mix reference file.

Rigopolus does not disclose saving an audio mix reference file that is stored separately from soundtracks referenced in the reference file. Claims 36 is thus further patentably distinguished over the art.

Allowability of Claims Over Rigopulos, Hruska & Furukawa

Rejection Summary

Claims 30-33 and 37 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 5,763,804 (Rigopulos) in view of U.S. Publication No. 2001/017415 (Hruska) and U.S. Patent No. 5,804,755 (Furukawa). Office Action, 10 June 2005, pg. 20.

Allowability of Claim 30

Regarding Claim 30, contrary to the Examiner's assertion, Rigopulos, Hruska and Furukawa fail to disclose or suggest an

> ... method for creating a polyphonic audio mix on a handheld mobile wireless communication device, comprising:
> playing a first soundtrack upon selecting the first soundtrack;
> selecting an audio characteristic for the selected first soundtrack while playing the first soundtrack;
> playing the selected audio characteristic of the first soundtrack while playing the first soundtrack upon selecting the audio characteristic.

Rigolopus does not play either the background track or the instrument track upon selection. In Rigolopus, the background track is selected in the setup stage (col. 8, lines 43-59) but not played until the joystick START button is depressed (col. 9, lines 33-39). After the setup is complete, the user selects an instrument. Col. 8, lines 66-67. In Rigopolus, however, music is not created using the instrument until the user depresses the PLAY button on the joystick. The Examiner relies on Hruska for teaching a handheld

mobile device having an audio mixer, but Hruska also fails to disclose or suggest the limitations discussed above.

The Examiner's assertion that it would have been obvious to add features of Furukawa to Rigopolus "... to create a more unique playback track" is not supported by the art. Rigopolus discloses a device that enables users to play a selected instrument, using an input device, in the presence of a background track. There is no disclosure or suggestion in Rigopolus to create polyphonic playback tracks. Rigopolus selects a background track and then selects an instrument track that is played using the input device. Rigopolus is unconcerned with creating polyphonic playback tracks. Claim 30 is thus patentably distinguished over the art.

Allowability of Claim 31

Regarding Claim 31 Rigopulos and Hruska fail to disclose or suggest in combination with Claim 30,

> ... the first soundtrack is a reference soundtrack, selecting the first soundtrack from a plurality of different reference soundtracks, selecting a second soundtrack from a plurality of non-reference soundtracks while the reference soundtrack is playing, playing the second soundtrack upon selecting the second soundtrack while the reference soundtrack is playing.

Rigolopus does not play either the background track or the instrument track upon selection. In Rigolopus, the background track is selected in the setup stage (col. 8, lines 43-59) but not played until the joystick START button is depressed (col. 9, lines 33-39). After the setup is complete, the user selects an

instrument. Col. 8, lines 66-67. In Rigopolus, however, music is not created using the instrument until the user depresses the PLAY button on the joystick. Claim 31 is thus patentably distinguished over the art.

Allowability of Claim 37

Regarding Claim 37, contrary to the Examiner's assertion, Rigopulos, Hruska and Furukawa fail to disclose or suggest an

> ... method for creating a polyphonic audio mix on a handheld mobile wireless communication device, comprising:
> playing a first soundtrack by selecting the soundtrack;
> selecting one of a second soundtrack and an audio characteristic of the first soundtrack while playing first soundtrack;
> if the second soundtrack is selected, playing the second soundtrack with the first sound upon selecting the second soundtrack without further input by user,
> if the audio characteristic is selected, playing the audio characteristic of the first soundtrack upon selecting the audio characteristic while playing the first soundtrack without further input by user.

Rigolopus does not play either the background track or the instrument track upon selection. In Rigolopus, the background track is selected in the setup stage (col. 8, lines 43-59) but not played until the joystick START button is depressed (col. 9, lines 33-39). After the setup is complete, the user selects an instrument. Col. 8, lines 66-67. In Rigopolus, however, music is not created using the instrument until the user depresses the PLAY button on the joystick. Thus, in Rigopolus, further input (i.e., depression of START and/or PLAY) is required after selecting the background track and/or the instrument track. The Examiner relies on Hruska for teaching a handheld mobile device having an audio mixer, but Hruska also fails to disclose or

suggest the limitations discussed above. Claim 37 is thus patentably distinguished over the art.

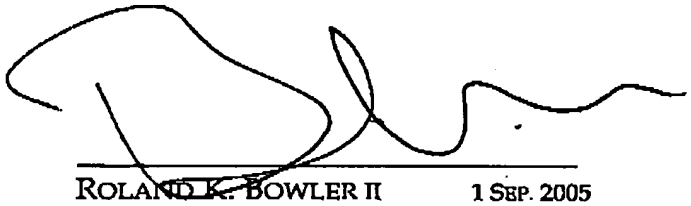
Prayer For Relief

In view of the discussion above, the Claims of the present application are in condition for allowance. Kindly withdraw any rejections and objections and allow this application to issue as a United States Patent without further delay.

FAHEY ET AL.
"Mobile Wireless Communication Handset With Sound Mixer And Methods Therefor"
Atty. Docket No. CS90041

Appl. No. 09/972,381
Confirm No. 5141
Examiner A. Flanders
Art Unit 2644

Respectfully submitted,



ROLAND K. BOWLER II 1 SEP. 2005
REG. NO. 33,477

MOTOROLA, INC.
INTELLECTUAL PROPERTY DEPT. (RKB)
600 NORTH U.S. HIGHWAY 45, AN475
LIBERTYVILLE, ILLINOIS 60048

TELEPHONE NO. (847) 523-3978
FACSIMILE NO. (847) 523-2350

MOBILE WIRELESS COMMUNICATION HANDSET WITH SOUND MIXER AND METHODS THEREFOR

FIELD OF THE DISCLOSURE~~INVENTIONS~~

[0001] The present disclosure ~~inventions~~ relates generally to mobile wireless communication devices, and more particularly to handheld cellular communication devices capable of mixing and playing polyphonic audio files and methods therefor.

BACKGROUND ~~OF THE INVENTIONS~~

[0002] Cellular handsets having sound mixers are known generally. In the P503i i-mode cellular telephone available from NTT DoCoMo, for example, the user must first select several soundtracks and then manually mix the selections. Particularly, in the P503i cellular telephone, the user first selects a music Category (Rock, Dance, Pops, etc.) soundtrack and then first and second Backing Pattern soundtracks in corresponding menus displayed sequentially after each selection. In the P503i ~~cellular telephone~~, the selected soundtracks are mixed manually only after making all selections. Thus in the P503i cellular telephone, the user cannot listen to more than one selected soundtrack at a time during the soundtrack selection process until after making all selections and manually mixing, since only individual soundtracks are played during the selection process. The P503i cellular telephone also permits the user to adjust the ~~K~~key and ~~T~~tempo of the mix,

but the selected changes in these characteristics cannot be heard until after making the selections and manually mixing.

[0003] The various aspects, features and advantages of the present ~~invention~~ disclosure will become more fully apparent to those having ordinary skill in the art upon careful consideration of the following Detailed Description ~~of the Invention~~ with the accompanying drawings described below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1 is an exemplary mobile wireless communication handset.

[0005] FIG. 2 is an exemplary process flow diagram for implementing various aspects of the inventions.

[0006] FIG. 3 is an exemplary soundtrack data set file stored on the handset.

[0007] FIG. 4 is an exemplary audio mix data reference file.

DETAILED DESCRIPTION ~~OF THE INVENTIONS~~

[0008]- FIG. 1 is a handheld mobile wireless communication device comprising generally a processor 10 and a DSP 12, memory 20, for example ROM, RAM, EEPROM, etc., a transmitter and receiver 30, inputs 40, for example, a keypad and/or joystick, microphone etc., outputs 50 including an audio output and an output signal connector interface, and a display 60.

[0009] The mobile wireless communication handset may be~~,~~ for example~~,~~ a cellular telephone, personal digital assistant, one-way or two-way pager, or some other handheld mobile communication device.

[00010] The ~~inventions are~~ disclosure is drawn generally to methods for dynamically creating polyphonic audio mixes on ~~the~~ handheld mobile wireless communication devices, and generally to methods for creating and storing polyphonic mixes using ~~only~~ limited data storage resources on wireless communications handsets, and generally to methods for integrating audio data reference files and soundtrack data files in the form of a polyphonic audio format file for uploading from wireless communications handsets, and combinations thereof.

[00011] The ~~inventions are~~ disclosure is implemented generally in software on handheld mobile wireless communication devices, including ~~a~~ polyphonic audio synthesizer software ~~program~~. In one embodiment, the audio synthesizer is a MIDI standard synthesizer, known by those of ordinary skill in the art. In other embodiments, the synthesizer may be of another standard or a proprietary audio file synthesizer. The

implementation of audio synthesizers on cellular handsets is known generally as discussed above in the Background of the instant specification.

[00012] The software is invoked by a user input command. In one embodiment, a polyphonic audio mix is created on a handheld mobile wireless communication device by selecting a first soundtrack, and playing the first soundtrack upon selection thereof. In the present disclosure ~~inventions~~, unless indicated otherwise, the playing of a soundtrack or sound effect of one or all of the soundtracks of the polyphonic mix occurs upon selection thereof, without additional input by the user.

[00013] While ~~the~~ one soundtrack is playing, for example, a ~~the~~ first selected soundtrack, a subsequent or second soundtrack is selected and played along with the one or more prior selected soundtracks. Thus by selecting and playing each subsequently selected soundtrack while one or more previously selected soundtracks are playing, the polyphonic audio mix is mixed dynamically as it is complied, which provides the user with an immediate indication of how the composition of the selected soundtracks will sound ~~as the audio~~ during creation.

[00014] In one implementation, soundtracks are mixed by selecting and de-selecting combinations of soundtracks, in any order~~,~~. The selected soundtracks ~~which~~ are mixed dynamically upon selection and unmixed upon de-selection until the user ~~complies~~ compiles a satisfying combination of soundtracks, which may include different sound effects discussed more

fully below. The compiled audio mix may be saved or discarded upon completion of the selection exercise.

[00015] In FIG. 2, a first soundtrack is played upon its selection at 210~~.~~ ~~f~~Then~~,~~ ~~a~~while the first soundtrack is playing~~,~~ a second soundtrack is played along with the first sound track upon selection of the second soundtrack at 220, etc. The selected soundtracks may also be de-selected while playing upon ~~up~~ re-selecting the same sound track at 210~~.~~ ~~f~~For example~~,~~ the first soundtrack is played upon selection, wherein by ~~re-selecting~~re-selection of the first soundtrack will result in de-selection of the first soundtrack~~at 210~~. The process of selecting and de-selecting soundtracks continues in no particular order until an appealing ~~combinations~~ combination of sounds are ~~mix~~mixed~~,~~ whereupon the user may save the mix at block 230, as discussed more fully below.

[00016] According to the process illustrated in FIG. 2, several soundtracks may be mixed~~.~~ ~~f~~For example~~,~~ a first soundtrack is selected and played, and then a second soundtracks is selected and played with the first soundtrack while the first soundtrack is playing~~.~~ ~~and then a~~Additional ~~third~~ soundtracks may be ~~is~~ selected and played while the first and second soundtracks are playing, etc. Any one or more of the selected soundtracks, for example~~,~~ the first soundtrack, may subsequently be subtracted from the mix, while the mix is playing, for example by de-selecting the first soundtrack. Alternatively, all of the selected soundtracks may be deselected simultaneously.

[00017] In one embodiment, a first soundtrack is selected from a first plurality of soundtracks, and a second soundtrack is selected from a second plurality of soundtracks. Additional soundtracks may be combined, or mixed, with the first and second tracks, as desired.

[00018] In one embodiment, at least one of the soundtracks is a base, or reference, soundtrack selected from a plurality of different base soundtracks. In a preferred embodiment, the reference soundtrack is selected before selecting any other soundtracks. Thereafter, one or more soundtracks are selected subsequently and mixed dynamically while the reference soundtrack and any other selected soundtracks are playing. Other embodiments are devoid of a base soundtrack.

[00019] The plurality of different reference soundtracks~~, for example,~~ may be characterized generally by corresponding rhythmic and harmonic characteristics~~,~~. ~~for example those~~ Exemplary characteristics are those associated with Jazz, Rhythm & Blues, Soul, Rock, Latin, and Classical and Big Band, among other types of music~~, respectively~~.

[00020] Some of the soundtracks may be selected from a group of soundtracks having corresponding melodies. In one implementation, a melodic soundtrack is selected from a plurality of musical instrument ~~instruments~~ soundtracks, for example, from either a percussion, or a wind, or a string instrument soundtrack. In another embodiment, each melodic

soundtrack has corresponding variations. For example, upon selection of a "piano" soundtrack, there may be several piano soundtrack variation sub-selections among which to choose.

[00021] In embodiments where there is a reference soundtrack, the instrument or melodic soundtracks available for selection may be dependent upon, or specific to, the reference soundtrack selected. Where Rhythm & Blues is selected as the reference track, for example, the instrument soundtracks available may be piano, drum, bass and horn and corresponding variations thereof. Where the reference soundtrack is Rock, different instrument soundtracks and corresponding variations are available.

[00022] In another embodiment, an audio characteristic or effect is selected for a selected soundtrack while playing the soundtrack. Exemplary sound effects include echo and reverberation, among others. De-selection of a soundtrack for which one or more effects have been selected, also de-selects the corresponding effects.

[00023] The audio characteristic of the soundtrack is changed while the soundtrack is playing upon selecting the audio characteristic, thus providing the user with an immediate indication of how the selected characteristic affects the soundtrack as the polyphonic file is created. After selecting a soundtrack, a sound characteristic, or effect, for the selected soundtrack is selected and played. Generally more than one global effect

may be changed or selected. Selection and de-selection of effects are also illustrated in FIG. 2.

[00024] In some embodiments, a global audio characteristic common to all of the selected soundtracks is selected and played while playing the selected soundtracks, thus changing the audio characteristic of all of the selected soundtracks while the soundtracks are playing. Generally more than one global effect may be changed or selected.

[00025] In some embodiments, the number of soundtracks selected is limited, for example, to 4 or 5 soundtracks. For example, the user may have the option of selecting one of three variations on as many as five different instruments. The user may also have the option of selection 1 or 2 or more track-specific sound effects, and 1 or 2 or more global sound effects applicable to all tracks.

[00026] Generally, the soundtracks and effects are made perceptible to a user of the handheld device, for example the soundtracks may be displayed or played audibly for selection by the user. In one embodiment, the soundtracks and effects are stored on the handheld device, and in another embodiment the soundtracks and effects are downloaded from some other location onto the device, either wirelessly or via a hardwired connection, by and upon selection thereof.

[00027] In another embodiment, the first soundtrack is selected to play for a first time interval, and another soundtrack is selected to play for a second time interval different than the first time interval. The time intervals of the soundtracks may be overlapping or separate.

[00028] In one embodiment, the soundtracks play the throughout the full interval of the audio mix, unless specified otherwise. In one embodiment, the time interval is determined when the soundtrack is selected relative to previously selected soundtracks already playing. Thus while one or more soundtracks play, the user may add an additional soundtrack by selecting the new soundtrack and after a time interval remove the new soundtrack by de-selecting (merely re-selecting) it.

[00029] Upon selecting the soundtracks and any effects, and corresponding time intervals, the audio mix is saved. In one embodiment, the newly created audio mixes are saved in an audio format file, for example, the MIDI format audio file. The MIDI audio format has a time reference, with which start and stop times for corresponding soundtracks may be associated.

[00030] FIG. 3 illustrates an exemplary soundtrack data set file 300 that is stored on the handset in one embodiment of the disclosure ~~invention~~. The exemplary data set includes a plurality of sets of instruments, or some other melodic, soundtracks, for example 310 and 320 in FIG. 3. In the exemplary embodiment each instrument or melodic soundtrack has three variations

312, 314 and 316, but more generally there may be more or less. Only one variation, variation 322, of the second plurality of instrument sets is illustrated, but generally there are more. The instruments tracks could instead be some other distinct melodic soundtrack and/or variations thereon.

[00031] The exemplary soundtrack data set file 300 also includes a plurality of sound effect soundtracks 330 including an effect soundtrack 332, 334 and 336 for a corresponding one of the soundtracks 312, 314 and 316, respectively. Each of the sound effect tracks 332, 334 and 336 may be, for example, a reverberation soundtrack. Alternatively, there could be another set of effects, for example a corresponding echo track, (not illustrated) for each of the soundtracks 312, 314 and 316. Generally, there are also, in some embodiments, corresponding effects soundtracks for each of the other soundtracks 322, etc. In some embodiments, there are no effect soundtracks. More generally, each soundtrack of the soundtrack data set file 300 in FIG. 3 is a different soundtrack.

[00032] The exemplary soundtrack data set file 300 also includes a corresponding reference or base soundtrack 302. In one embodiment, there is a plurality of unique soundtrack data set files each having a corresponding base track, e.g., Jazz, Blues, Rock, Pop, etc., and corresponding instrument variation soundtracks stored on the handset. Additional soundtrack data set files may be downloaded onto the device, for example, for a fee or as part of a subscription.

[00033] In one embodiment, a polyphonic audio mix is created on the handset by entering reference data for corresponding soundtracks of a selected soundtrack data set file into an audio mix data reference file, for example, by selecting plural soundtracks at a user interface, as discussed above. The audio mix data reference file having soundtrack reference data is representative of the user defined polyphonic audio mix. In one embodiment, the audio mix data reference file is not in an audio file format.

[00034] The audio mix data reference file having the reference data is stored on the handset as a distinct file, separately from the soundtrack data set files. The audio mix data reference file is itself preferably devoid of soundtrack data. Thus many audio mixes may be mixed and saved in the form of audio mix data reference files by the user without substantial memory usage, which is often limited on mobile communication handsets, since only the audio mix data reference file having the reference data is created and stored. In other embodiments, the audio mix data reference file includes copies of the soundtrack data, but this requires comparatively substantial memory for storage.

[00035] In FIG. 4, the audio mix data reference file 400 includes a file name field 410, one or more global sound file effect fields 420, for example ~~T~~tempo and/or ~~K~~key, and a plurality of soundtrack fields 430, 432, 434, etc. In embodiments where a base track is desired, the audio mix data reference file includes a base track field 450.

[00036] The file name field 410 stores file name data designated by the user for the corresponding user defined polyphonic audio file. The file name data may be entered by the user, for example upon completion of mixing the soundtrack.

[00037] The global sound effect reference field 420 stores global effect reference data, which is communicated to the synthesizer when the polyphonic audio mix is played. More than one global effect reference may be stored in the field 420, or alternatively multiple reference data fields may be provided for storing corresponding sound effect references. In one embodiment, the one or more sound effect fields provide the audio synthesizer with instructions for the sound effects that are to be played for the corresponding polyphonic audio mix.

[00038] The base track field 450 stores base track reference data, which references the base track, if any, associated with the corresponding polyphonic audio mix. In one embodiment, the base track field provides the audio synthesizer with instructions for which base track is to be played for the corresponding polyphonic audio mix.

[00039] The soundtrack reference fields 430, 432, etc. store soundtrack reference data, which references corresponding soundtracks associated with the corresponding polyphonic audio mix. In one embodiment the presence

of particular soundtrack reference in the soundtrack fields indicates that the soundtrack has been selected.

[00040] In some embodiments, time is associated with each of the soundtrack reference fields. The time may, for example, be measured as a delay from the time that the polyphonic mix is initiated or played. Thus the soundtrack referenced in each field is played at the corresponding time associated therewith. A subsequent entry of a reference to the same soundtrack played previously may be used to toggle the soundtrack off. Thus the start and stop time for the soundtrack is entered as the soundtrack is selected and de-selected.

[00041] In other embodiment, the audio mix data reference file 400 has a reference field corresponding to each of the soundtracks and effects in a corresponding soundtrack data set file. Each field of the audio mix data reference file 400 also has an on/off code ~~which~~ that is set or re-set upon selection of the corresponding soundtrack when the corresponding polyphonic mix is created. Thus, when it is desired to play the polyphonic mix, the audio mix data reference file 400 references only those soundtracks and effects that have been switched on for play by the audio synthesizer.

[00042] According to another aspect of the disclosure~~invention~~, the audio mix data reference file 400 without soundtrack data is integrated with a corresponding soundtrack data set file 300 into a common audio format file for uploading from the handset, for example to another user.

[00043] In one embodiment, the integrated audio mix data reference and the soundtrack data set files are integrated irreversibly. Thus the recipient of the integrated audio file may listen to the audio file as mixed originally, but cannot extract the soundtrack data set file 300 for making new audio files based on the soundtrack data set file. Providing the irreversibly integrated audio format file permits users to sample the associated soundtrack data set file, limited to the corresponding mix, without providing full access thereto.

[00044] While the present ~~inventions~~ disclosure and what is considered presently to be the best modes thereof have been described in a manner that establishes possession thereof by the inventors and ~~that~~ enables those of ordinary skill in the art to make and use the same~~inventions~~, it will be understood and appreciated that there are many equivalents to the exemplary embodiments disclosed herein and that myriad modifications and variations may be made thereto without departing from the scope and spirit thereof~~of the inventions,~~. Thus ~~which are~~ the invention is to be limited not by the exemplary embodiments but by the appended claims.